Bariatric surgery and fractures

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Abstract: Obesity is escalating at an alarming rate globally and threatens healthcare systems worldwide. Although bariatric surgery has emerged as an effective treatment, and numbers of operations performed worldwide have risen sharply,1 many commentators still question surgical means to treat obesity. Scepticism has been fuelled by some evidence of negative long term effects including increased risks for nephrolithiasis and chronic kidney disease,2 relapse of type 2 diabetes mellitus,3 4 alcohol consumption,5 and suicide.6

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EDITORIALS

Bariatric surgery and fractures

Surgeons should consider assessing fracture risk in post-surgical patients

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Obesity is escalating at an alarming rate globally and threatens healthcare systems worldwide. Although bariatric surgery has emerged as an effective treatment, and numbers of operations performed worldwide have risen sharply,[1] many commentators still question surgical means to treat obesity. Scepticism has been fuelled by some evidence of negative long term effects including increased risks for nephrolithiasis and chronic kidney disease,[2] relapse of type 2 diabetes mellitus,[3 4] alcohol consumption,[5] and suicide.[6]

Bariatric surgery may also have detrimental effects on bone health, indicated by a reduced bone mineral density postoperatively.[7-10] However, whether this translates into a higher fracture risk is unclear.

The linked study by Rousseau and colleagues (doi:10.1136/bmj.i3794) aims to fill this gap in knowledge and evidence.[11] The authors did a retrospective, nested case-control study including patients after bariatric surgery (n=12 767), as well as obese (n=32 028) and non-obese (n=126 760) controls matched for sex and age. They used data from physician billing claim databases from 2006 to 2014 to compare the risk and site of fractures in bariatric patients and controls, making comparisons both before and after surgery. The first key finding is that bariatric surgery patients were more likely to sustain fractures after surgery than were obese (adjusted relative risk 1.38, 95% confidence interval 1.23 to 1.55) and non-obese control groups (1.44, 1.29 to 1.59). Secondly, fracture sites changed after bariatric surgery to a distribution typically associated with osteoporosis. Thirdly, fracture risk was significantly associated only with biliopancreatic diversion, which represents less than 5% of bariatric procedures performed worldwide.[1]

Rousseau and colleagues contribute to an important research area, exploring the long term effects of bariatric surgery. Strengths of their study include a large sample size, a long duration of follow-up, and their comparison of different bariatric surgical techniques. However, epidemiological registry data can have specific flaws and limitations that must be taken into account when interpreting their findings.

Firstly, the authors do not report any potential differences among the groups in overall use of drugs (for example, steroids), vitamin D supplementation, menopausal status, or the cause of fractures. Secondly, the bariatric surgery group and the obese control group are hard to compare confidently without information on body weight or body mass index. Individuals were included in the obese control group if there was a diagnostic code for obesity, but the authors do not report the severity of obesity or reasons for medical treatment among controls.

Thirdly, different observation periods are compared before and after the surgery. To overcome this potential confounding, the authors did a longitudinal comparison within the bariatric group to investigate specifically the change in fracture risk before and after surgery. They found that the overall risk of fractures was elevated after the surgery compared with before the operation, but the difference did not attain statistical significance (adjusted relative risk 1.08, 0.97 to 1.21). Thus, postoperative differences between groups may be simply due to the fact that the bariatric group already had a higher incidence of fractures preoperatively. However, the statistical significance of the comparison between the relative fracture risk of bariatric patients (adjusted relative risk 1.30, 1.21 to 1.39) before surgery and the risk of the obese control group (1.18, 1.13 to 1.23) is not reported.

The study by Rousseau and colleagues explores valid questions and represents an important contribution to the evidence supporting the long term management of patients after bariatric surgery. However, limitations in the design prevent any confident answer to the question “does bariatric surgery increase the risk of fractures?” Causal relations between a treatment and an event should ideally be investigated in carefully designed prospective randomised controlled trials. Epidemiological registry studies have certainly misled us in the past.[12-14]

As long as our understanding of bone physiology after bariatric surgery remains limited, and the clinical consequences of physiological alterations remain untested by appropriate prospective studies, we have to continue to follow guidelines on nutritional supplementation that include the best available evidence.[15] On the basis of the data presented by Rousseau and colleagues, as a bariatric surgeon I will certainly consider including assessment of fracture risk in the interdisciplinary algorithm of post-bariatric care for all my patients in the future.

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